Summary of Applied Technologies

Waste Reduction Through Applied Technologies (AT)

The following overview briefly describes technologies that have traditionally not been considered for their Waste Reduction benefits, but primarily as process technologies for enhanced product quality or for their economic benefits. These ATs also do have potential Waste Reduction capabilities.

These technologies are not "one size fits all." They are practical only under certain conditions, but they can greatly reduce waste and save money where they can be used. However, these technologies do lend themselves to innovative applications and should be considered as an option even outside their traditional industrial sectors.

This summary will familiarize you with the general capabilities of the technologies. For basic information about each technology, see the AT manual for that technology.

If a potential application is suspected, contact an equipment vendor or an engineering consultant that specializes in the technology. This should be the first step in determining whether the potential use is practical. Your electric utility or the Electric Power Research Institute (800-432-0267) are also valuable resources.

For further information about these manuals or the availability of videos on these ATs, contact Steve Hillenbrand at the Tennessee Valley Authority at sjhillenbrand@tva.gov.

Waste Reduction through *Applied Technologies*

TECHNOLOGY	Saves $$$	Increases Quality	Reduces Air Emissions	Reduces Hazardous Waste	Reduces Solid Waste	Reduces Waste Water	Reduces Energy Use
Direct Resistance	X	X	X	X	X	X	X
EDM Electrical Discharge Machining	X	X	X		X		X
Heat Pump	X	X	X		X		X
Indirect Resistance	X	X	X		X		X
Infrared	X	X	X	X			X
Induction	X	X	X	X	X	X	X
Laser	X	X	X		X	X	X
Membrane	X	X	X	X	X	X	
Microwave	X	X	X				X
Plasma Arc	X	X	X		X	X	
Plasma Nitriding	X	X	X	X			X
RF Radio Frequency	X	X	X				X
UV Ultraviolet	X	X	X	X	X	X	X
Waterjet	X	X	X		X		

Waste Reduction through *Applied Technologies*

Process \ Technology	Direct Resistance	EDM	Heat Pump	Indirect Resistance	Infrared	Induction	Laser	Membrane	Microwave	Plasma Arc	Plasma Nitriding	RF	UV	Waterjet
Heating - metals	X			X	X	X	X			X				
Heating - nonmetals	X low T°			X	X				X	X		X		
Heating - in vacuum				X	X	X			X			X		
Heating - brazing & welding				X		X	X			X				
Heating (pre) - metals	X			X	X	X								
Heating (pre) - plastics				X	X				X			X		
Heating (post) - non-metals				X	X				X			X		
Heat treating	X			X	X low T°	X	X			X	X	X low T°		
Heating - space			X	X	X									
Cooling - space			X											
Kiln Drying - Lumber			X	X					X			X		
Drying, evap., distill. Concentration			X	X	X	X		X	X			X		

Waste Reduction through *Applied Technologies*

Process \ Technology	Direct Resistance	EDM	Heat Pump	Indirect Resistance	Infrared	Induction	Laser	Membrane	Microwave	Plasma Arc	Plasma Nitriding	RF	UV	Waterjet
Drying - foundry sand core				X	X				X			X		
Bonding - metal to plastic				X		X	X					X		
Curing - thermoset adhesive				X	X	X	X		X			X	X	
Curing or drying- textiles			X	X	X	X			X			X	X	
Curing - coatings and inks				X	X	X			X			X	X	
Stripping - coatings				X		X	X					X		X
Machining - tools, dies, molds		X					X							
Fluid recovery or separation								X						
Cutting							X			X				X
Reuse - process fluid			X	X				X					X	
Food processing	X		X	X	X			X	X			X		X
Papermaking			X	X	X		X	X				X	X	X
Petrochemical			X	X		X		X	X					
Electronics									X				X	

Applied Technology
Potential in Manufacturing

Industry SIC Applied Tech	Food 20	Tobac 21	Textile 22	Apparel 23	Lumber 24	Furn 25	Paper 26	Printing 27	Chem 28	Petrol 29
Direct Resistance	MED	LOW	LOW	LOW	LOW	MED	LOW	LOW	LOW	LOW
EDM	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
Heat Pump	**HI**	LOW	MED	LOW	**HI**	LOW	MED	LOW	MED	MED
Indirect Resistance	**HI**	MED	MED	MED	MED	MED	MED	MED	MED	MED
Infrared	MED	MED	**HI**	MED	MED	MED	**HI**	**HI**	MED	MED
Induction	LOW	LOW	MED	LOW	LOW	MED	LOW	LOW	MED	LOW
Laser	LOW	LOW	LOW	LOW	LOW	MED	MED	LOW	LOW	LOW
Membrane	**HI**	MED	**HI**	LOW	LOW	MED	**HI**	MED	**HI**	MED
Microwave	**HI**	MED	LOW	LOW	LOW	LOW	LOW	LOW	MED	LOW
Plasma Arc	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
Plasma Nitriding	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
RF	MED	MED	**HI**	LOW	MED	MED	MED	LOW	LOW	LOW
UV	LOW	LOW	MED	LOW	LOW	MED	MED	**HI**	LOW	LOW
Waterjet	MED	LOW	LOW	LOW	LOW	MED	MED	LOW	MED	MED

Applied Technology
Potential in Manufacturing

Industry SIC Applied Tech	Rubber 30	Leather 31	Stone 32	Pmetal 33	MetFab 34	Mach 35	Elect 36	Transp 37	Instr 38	Misc 39
Direct Resistance	LOW	LOW	MED	**HI**	**HI**	MED	MED	MED	MED	MED
EDM	LOW	LOW	LOW	LOW	MED	**HI**	**HI**	**HI**	MED	MED
Heat Pump	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
Indirect Resistance	MED	MED	MED	MED	**HI**	MED	MED	MED	MED	MED
Infrared	**HI**	MED	**HI**	MED	**HI**	**HI**	**HI**	**HI**	**HI**	**HI**
Induction	MED	LOW	MED	**HI**	**HI**	**HI**	**HI**	**HI**	MED	MED
Laser	LOW	LOW	LOW	LOW	**HI**	**HI**	**HI**	**HI**	**HI**	MED
Membrane	LOW	MED	LOW	MED	MED	MED	MED	MED	MED	MED
Microwave	MED	LOW	MED	MED	LOW	LOW	**HI**	LOW	LOW	LOW
Plasma Arc	LOW	LOW	MED	**HI**	**HI**	**HI**	**HI**	**HI**	LOW	MED
Plasma Nitriding	LOW	LOW	LOW	LOW	MED	**HI**	**HI**	**HI**	MED	MED
RF	**HI**	LOW	LOW	LOW	**HI**	**HI**	**HI**	LOW	LOW	LOW
UV	MED	LOW	LOW	LOW	**HI**	**HI**	**HI**	**HI**	**HI**	MED
Waterjet	MED	MED	MED	LOW	**HI**	**HI**	**HI**	**HI**	MED	MED

This information is designed to help you determine **potential** applications for the technology. You are encouraged to contact one of the listed vendors or a consultant for details and pricing.

This manual is not intended as a recommendation of any particular technology, process, or method. Mention of trade names, vendors, or commercial products do not constitute endorsement or recommendation for use. It is offered for educational and informational purposes and is advisory only.

Parts of this manual are copyrighted as indicated on the bottom of each sheet and therefore may not be copied without the approval of the copyright owner.

For reprints write to:
TVA Economic Development
400 West Summit Hill Drive
Knoxville, TN 37902-1499

E-Mail:
sjhillenbrand@tva.gov

Developed with funding from the U.S. Environmental Protection Agency - Center for Environmental Research Information